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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/535,111	05/16/2005	Jacques Morineau	18846	3584

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EXAMINER	
WEST, PAUL M	
ART UNIT	**PAPER NUMBER**
2856	
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05/16/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/535,111	MORINEAU ET AL.	
	Examiner	Art Unit	
	Paul M. West	2856	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *05 March 2007*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-12* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-6 and 10-12* is/are rejected.

7)☒ Claim(s) *7-9* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Objections

1. Claims 7 and 8 objected to because of the following informalities: In claims 7 and 8 it is somewhat unclear what "the latter" refers to since only one item is mentioned before the use of this phrase. Furthermore the use of "the latter" in the claims is somewhat ambiguous and it would be clearer to refer to the item directly. Appropriate correction is required.

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1 and 2 are rejected under 35 U.S.C. 102(b) as being anticipated by Dahl et al (4,284,951).

3. Regarding claim 1, Dahl et al teach a method of measuring the height of a liquid comprising: making, on an electric circuit powered with high frequency alternating current from source 32, a comparison between the impedance of a line probe 10 and a reference resistor 38 using a resistive measuring bridge (Fig. 3), the probe 10 submerged in a tank of fluid 12 of which the height is to be determined forming one arm of the bridge and the reference resistor 38 forming an opposite arm of the bridge, a comparison signal resulting from alternate measurement of the signal on each of the

arms (i.e. the signal through resistor 38 must be measured and known in order to use the measuring bridge to measure the impedance in probe 10); and processing the comparison signal to obtain the height of the liquid (Col. 3, lines 22-25).

4. Regarding claim 2, Dahl et al teach the probe 10 being metallic and of a straight-line shape (Col. 2, lines 22-27).

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. Claims 3-5,11 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dahl et al.

7. Regarding claim 3, Dahl et al are silent as to the length of the probe, but it would have been obvious to one of ordinary skill in the art to make the probe any length number of lengths between 0.1m and 10m because there are battery cells which would require liquid levels to be measured in this range.

8. Regarding claim 4, Dahl et al are silent as to the supply frequency of the circuit, however it would have been obvious to one of ordinary skill in the art to use an frequency between 4 Hz and 20 Hz because power supply systems using these frequencies common and readily available in the art.

9. Regarding claim 5, Dahl et al do not specifically disclose the value of the reference resistor, however it would have been obvious to design the value to be one that is in the same range as the impedance of the measuring probe, such as at the middle of the range, because this allows the probe impedance to be compared with the reference resistor value with the most accuracy and precision over it's entire range of values.

10. Regarding claims 11 and 12, Dahl et al only teach using the method to measure the level of an electrolyte, however the method taught by Dahl et al can be used with an number of liquids because the method only measures a changing resistance between two electrodes. It would have been obvious to one of ordinary skill in the art to apply the method to many other liquids including low permittivity liquids and hydrocarbons because liquid level information is useful in many environments not just in a battery cell.

11. Claims 6 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Holt (6,486,679) in view of Dahl et al.

12. Regarding claim 6, Holt teaches a method of measuring an impedance using a circuit with a measuring bridge, logarithmic amplifier stage and differential amplifier stage (Fig. 3) for processing an impedance signal.. Holt does not teach the impedance being that of a probe line submerged in a liquid whose height is to be measured. Dahl et al teach a method of measuring the height of a liquid comprising: making, on an electric circuit powered with high frequency alternating current from source 32, a comparison between the impedance of a line probe 10 and a reference resistor 38 using a resistive

measuring bridge (Fig. 3), the probe 10 submerged in a tank of fluid 12 of which the height is to be determined forming one arm of the bridge and the reference resistor 38 forming an opposite arm of the bridge, a comparison signal resulting from alternate measurement of the signal on each of the arms (i.e. the signal through resistor 38 must be measured and known in order to use the measuring bridge to measure the impedance in probe 10); and processing the comparison signal to obtain the height of the liquid (Col. 3, lines 22-25). It would have been obvious to one of ordinary skill in the art to combine the teachings of Dahl with the method of Holt because using a line probe with the impedance measuring circuit would allow the circuit to be used for a practical application and would give greater utility.

13. Regarding claim 10, Holt teaches a circuit which measures an impedance using a circuit with a measuring bridge, logarithmic amplifier stage and differential amplifier stage (Fig. 3) for processing an impedance signal. Holt does not teach the impedance being that of an open-ended line submerged in a liquid whose height is to be measured. Dahl et al teach measuring impedance of an open-ended line 10 submerged in a liquid 12 whose height is to be measured. It would have been obvious to one of ordinary skill in the art to combine the teachings of Dahl with the measuring circuit of Holt because using a line probe with the impedance measuring circuit would allow the circuit to be used for a practical application and would give greater utility.

Allowable Subject Matter

14. Claims 7-9 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Response to Arguments

15. Applicant's arguments filed 5 March 2007 have been fully considered but they are not persuasive.

16. Applicant has argued that Dahl et al do not teach a "high frequency" alternating current. In claim 1, no frequency range is given so that the term "high frequency" could be almost any frequency as any given frequency may be considered high when compared to some lower frequency. With regard to claim 4, an obviousness rejection is made and the rejection is made and maintained as the frequency range claimed is commonly used in the electrical circuits and does not constitute a novel limitation. Applicant has not shown how that particular frequency range provides any particular advantage over other frequencies.

Conclusion

17. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within

TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Paul M. West whose telephone number is (571) 272-8590. The examiner can normally be reached on Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hezron Williams can be reached on (571) 272-2208. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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